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ABSTRACT

This study synthesized research on teacher efficacy. A 14-stage model was implemented to identify and analyze characteristics found in the synthesis population of 89 primary studies which addressed teacher efficacy. The 89 primary studies yielded 789 distinct and 973 total research hypotheses; 25 distinct and 973 total teacher efficacy constructs; and 425 distinct and 973 total predictor constructs. Meta analyses were conducted on research hypotheses occurring five times or more. Seven relationships between a teacher efficacy construct and a predictor construct were addressed through a meta analytical process. Sample sizes for studies included ranged from 5-31. Size and direction of relationships identified in the 89 primary studies for the research hypotheses occurring five or more times was closely aligned with size and direction of relationships identified in the theoretical framework of this investigation. The review identified: an inverse relationship between personal teaching efficacy and general teaching efficacy; a positive relationship between female gender and personal teaching efficacy and general teaching efficacy; a positive relationship between overall teaching efficacy and general teaching efficacy with years of experience. Recommendations to guide primary studies focus on: data reporting standards, indicators of explained variance, and uniformity of measures. (Contains 46 references.) (SM)

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# TEACHER EFFICACY: A RESEARCH SYNTHESIS

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## TEACHER EFFICACY: A RESEARCH SYNTHESIS

### Introduction

The actual study of teacher efficacy is relatively new. In 1989 Susan Rosenholtz described research on teacher efficacy as being in its very earliest stages (Ross, 1994). Since then the research on teacher efficacy has grown substantially. Ross stated that there is evidence that in the earliest years of instruction that teaching experience has an effect: personal teaching efficacy increases and general teaching efficacy decreases with experience in the profession. Teacher efficacy is higher in classes in which teachers feel prepared and where classes consist of students who are both relatively orderly and of higher ability (Gibson and Dembo, 1984). Those teachers who attribute student success and failure to efforts within their control are more likely to score higher on teacher efficacy measures (Guskey, 1987; Tschannen-Moran, Hoy, & Hoy, 1998; Vitali, 1994). There is evidence that teacher efficacy is higher in schools characterized as having low stress, joint commitment to learning goals, and faculties of satisfied teachers (Moore and Esselman, 1992; Warren, 1993). High efficacy teachers are more likely to be active members of the school organization and collaborate with fellow teachers (Edwards, Green, & Lyons, 1996; Poole and Okeafor, 1989).

Higher teacher efficacy is associated with current notions of good teaching practices (Trentham, Silvern, & Brogdon, 1985). Higher efficacy is associated with the use of more challenging teaching techniques, teachers' willingness to try innovative methods (Ghaith and Yaghi, 1997; Guskey, 1988; Rangel, 1997), and with humanistic classroom management practices. The findings about the impact of teacher efficacy on student achievement have been consistent. Higher teacher efficacy enhances student

mastery of both cognitive and affective goals (Guskey, 1988; Ross, 1992; Ross, 1994; Turgoose, 1996; Watson, 1991).

Educational researchers have devoted much effort to the study of teacher efficacy over the past 10 years. These studies have examined the relationship of the teacher efficacy construct with gender (Haydel, 1997; Wittmann, 1992), experience (Hoy and Woolfolk, 1993; Ghaith and Yaghi, 1997; Walker and Cousins, 1994), teacher certification or degree (Hoy and Woolfolk, 1993; Huguenard, 1992; Serna, 1990), grade taught (Larsen, 1996; Petrie, Hartranft, & Lutz, 1995; Soodak and Podell, 1996; Taylor, 1992), campus leadership (Adams, 1996; Hartnett, 1995), classroom characteristics and student behavior (Emmer and Hickman, 1991; Melby, 1995), work with special needs students (Meijer and Foster, 1988; Ross, Cousins, & Gadalla, 1996; Stanovich and Jordan, 1998), and job satisfaction (Fritz, Miller-Heyl, Kreutzer, MacPhee, 1995; Hyson 1991). Additionally, numerous researchers have studied the relationship of general teaching efficacy to personal teaching efficacy (Fritz et al., 1995; Guyton, 1994; Haydel, 1997; Klein, 1996; Larsen, 1996; Moore and Esselman, 1992; Ohmart, 1992; Tschannen-Moran et al., 1998; Woolfolk and Hoy, 1990).

**Statement of the Problem**

There has not been an empirical synthesis of the research on teacher efficacy. Research suggests that teacher efficacy has been related to teachers' classroom behaviors, their openness to new ideas, and their attitudes toward teaching. Teacher efficacy appears to influence student achievement, attitude, and affective growth. "Research on teacher efficacy has provided a consistent set of findings that

demonstrate the importance of the construct as a predictor of student and teacher outcomes" (Ross 1994, p. 28).

## Purpose of the Inquiry

To maximize knowledge from existing studies, reliable and valid procedures must be used to synthesize findings. The purpose of this study was to synthesize findings on teacher efficacy. The study investigated research that has been conducted on teacher efficacy, synthesized the findings in the primary studies, and considered the implications for educators. Currently no meta-analysis of teacher efficacy has occurred. Extensive primary studies have occurred without a synthesis of the multitude of findings. Since research supports the positive relationship of high teacher efficacy on both the organization of the school as well as student achievement, it appears that a meta-analysis will provide a much better understanding of the construct, its variables, and how it is manifested in a school setting.

## Objectives

A model for meta-analysis by Thompson, Hoyle, and McNamara (1997) and meta-analysis procedures by Hunter and Schmidt (1990) were used to guide this quantitative synthesis. This inquiry addressed the following six objectives:

1. Specifying the primary studies that address teacher efficacy and providing sufficient

   information for quantitative synthesis.
2. Identifying the research hypotheses and tests and the target population, teacher efficacy constructs, and predictor constructs around which these hypotheses are generated.

3. Identifying the statistical hypotheses and inferential rules used to connect empirical evidence to the corresponding research hypotheses.
4. Estimating the population effect sizes corresponding to selected research hypotheses.
5. Elaborating the moderator variables that increase the explanatory power associated with selected research hypotheses.
6. Assessing the stability of the population effect size estimates generated for selected research hypotheses over the period of time represented in the primary studies.

Twenty-three research questions were asked and addressed that were directly aligned to one of the above objectives.

## Methodology

The design of this research study was conceptualized as a fourteen-stage model based the work of Thompson et al. (1997). This appears in Table 1.

**TABLE 1**

| Stage | Description |
|---|---|
| • Stage 1: | Developing the theoretical framework |
| • Stage 2: | Specifying the population |
| • Stage 3: | Designing the classification system |
| • Stage 4: | Designing the coding system |
| • Stage 5: | Coding the data |
| • Stage 6: | Archiving the coded data |
| • Stage 7: | Constructing the research hypotheses inventory |

Table 1 (continued)

- Stage 8: Identifying the effect sizes
- Stage 9: Describing the articles
- Stage 10: Describing the effect sizes
- Stage 11: Estimating the parameters
- Stage 12: Elaborating the moderator variables
- Stage 13: Assessing the stability of findings over time
- Stage 14: Specifying the recommendations

The effect size indicator used for statistical analysis was the Pearson Product-Moment Correlation Coefficient. The correlation coefficient expresses the relationship between a distinct predictor variable and a distinct criterion variable and can be cumulated across all studies (Hunter & Schmidt, 1990).

## Findings

This inquiry synthesized the available research on teacher efficacy. A 14-stage model was implemented to identify and analyze study characteristics found in the synthesis population of 89 primary studies addressing teacher efficacy and providing sufficient information for quantitative synthesis.

The 89 primary studies yielded: (1) 789 distinct and 973 total research hypotheses; (2) 25 distinct and 973 total teacher efficacy constructs; and, (3) 425 distinct and 973 total predictor constructs. Using the statistical test as the unit of analysis yielded these conclusions: (1) 973 statistical tests were investigated; (2) 973 correlational effect sizes were reported in or derived from the 89 primary studies; (3) 270 (27.7%) effect sizes ranged in absolute value from .00 to .09; (4) 453 (46.5%) effect

sizes ranged in absolute value from .10 to .29; (5) 178 (18.3%) effect sizes ranged in absolute value from .30 to .49; and, (6) 72 (7.4%) effect sizes ranged in absolute value greater than or equal to .50.

A meta-analysis was conducted on the research hypotheses occurring five times or more with the results displayed in Table 2. Seven relationships between a teacher efficacy construct and a predictor construct were addressed through a meta-analytical process. Sample sizes for studies included ranged from 5 to 31. The size and direction of relationships identified in the 89 primary studies for the research hypotheses occurring five or more times is closely aligned with the size and direction of relationships identified in the theoretical framework of this investigation. For instance, both of the frequently occurring research hypotheses that had gender as a predictor construct, found a moderate positive relationship between gender 1=male and 2=female and personal teaching efficacy and general teaching efficacy. This moderate relationship indicates that females tended to have both higher personal and general teaching efficacy than did males. This positive relationship was articulated in the review of the literature.

TABLE 2

| Research Hypothesis | Number of Effect Sizes | Overall Effect Size | Standard Deviation of Population Correlation |
|---|---|---|---|
| Personal Teaching Efficacy related to General Teaching Efficacy | 31 | -0.15063 | 0.29194 |
| Personal Teaching Efficacy related to Years of Teaching Experience | 21 | -0.03121 | 0.1972 |
| General Teaching Efficacy (Rand 1) related to Personal Teaching Efficacy (Rand2 ) | 8 | 0.278 | 0.1382 |
| Personal Teaching Efficacy related to Gender | 8 | 0.16286 | 0.02168 |
| General Teaching Efficacy related to Years of Teaching Experience | 8 | -0.09346 | 0.18099 |
| Overall Teaching Efficacy related to Years of Teaching Experience | 5 | -0.0995 | 0.18099 |
| General Teaching Efficacy related to Gender | 5 | 0.159 | 0.2566 |

The inverse relationship between personal teaching efficacy and general teaching efficacy was identified in the literature review. This relationship was reported to be inverse in that as one construct increased the other decreased. General teaching efficacy was specifically addressed as being related to gender. The review of the literature of this relationship indicated a positive relationship between female gender and general teaching efficacy as well as personal teaching efficacy. Female teachers tended to be more efficacious than did male teachers. Several authors' works were cited (Hoy & Woolfolk, 1990; Ross, 1994; Benz et al., 1992) regarding the relationship

of overall teaching efficacy and general teaching efficacy with years of experience, with a consensus, that as teaching years increase the overall teaching efficacy decreases.

This study limited an in-depth meta-analysis to the most often-occurring research hypotheses. Due to this limitation, only those hypotheses occurring five or more times were identified for a meta-analysis. In these most often-occurring research hypotheses, demographic factors predominated including gender and years of teaching. These demographic characteristics were generally weak predictors of teacher efficacy. However, there were 54 strong positive predictors of teacher efficacy constructs. Several trends can be noted in these large positive effect sizes. Predictor constructs of student engagement and student achievement are both strongly correlated to teacher efficacy. Additionally, teacher success and organization factors such as shared decision making and being part of a coaching network are strong predictors of high teacher efficacy. Finally, instruction strategies such as the use of centers, cooperative learning and implementation of instructional changes as well as integration of the curriculum are also strongly correlated to high teacher efficacy.

## Recommendations

The following recommendations for guidelines for primary studies and data reporting are offered with the intent that these recommendations would assist in maximizing knowledge of teacher efficacy in all primary studies.

Data reporting standards. To encourage and enable researchers to calculate effect sizes and to perform meta-analytic synthesis on existing research data reporting standards in primary studies should become more rigorous. Hunter and Schmidt (1990) have recommended that for correlational and multiple regression studies that means,

standard deviations, sample sizes, measurement reliability and validity, and zero-order correlation matrices for each variable be published. They also suggest that all descriptive statistics be published regardless of statistical significance.

Indicators of explained variance. The practical significance of findings in primary studies should receive more emphasis. The proportion of explained variance may be used as an indicator of practical significance (McNamara, 1978). Since most test statistics or effect sizes are convertible to indicators of explained variance, it is suggested that this explained variance be part of the reported research findings.

Uniformity of measures. The measures employed to measure teacher efficacy constructs should be more uniform in primary studies. Thirty-four different measures for 25 teacher efficacy constructs were reported in this investigation. The measure used to assess the teacher efficacy construct could easily be a moderating variable in the reporting of a correlation with a specific predictor construct. It is suggested that measures of teacher efficacy become more uniform across studies leading to more reliable and valid meta-analytical findings.

## Future Research

This quantitative synthesis of teacher efficacy research was exhaustive to the extent that it utilized all available primary studies relating to teacher efficacy that were identified in the search of nine databases. This inquiry synthesized and extended knowledge of teacher efficacy research published in primary studies through December 1998. Analysis of the content provided understanding and insights into the construct of teacher efficacy along with the operationalization of this concept and measurements used. Although the model for this synthesis is relatively new, the model can be

replicated and offers researchers a means of synthesizing research findings in theoretical constructs in a variety of primary studies.

Comparison to models. A comparison of this model to other more traditional models could be the topic of a future inquiry resulting in possible modification and refinement of the Thompson, Hoyle, and McNamara model. This would make it more useful for future quantitative syntheses of primary studies.

Time-ordering of findings. This inquiry attempted to analyze effect sizes of frequently occurring research hypotheses over time. Analyzing correlations over time can provide useful information in terms of identifying trends and changes over time. Time-order analyses were limited to frequently occurring research hypotheses along with the author(s), date, and target population along with population characteristics. Other study findings including teacher efficacy constructs, predictor constructs, and measures employed could be time-ordered. This analysis could provide insights into each of these components and the respective role in research over time thus contributing a deeper understanding of the teacher efficacy construct and its multiplexities.

Examination of the effects of non-demographic variables. The behavioral and organizational variables of student achievement, use of promising research based instructional strategies, and organizational variables related to school climate, role in shared decision making and collegiality are all issues that have been shown to be strongly correlated to teacher efficacy and are variables well worth future study. This could be accomplished by an in-depth analysis of the existing data utilizing subsets of variables.

Teacher efficacy has shown to be strongly correlated to student achievement. High efficacy teachers' students demonstrate high student achievement (Ross, 1992; Ross, 1996; Tracz & Gibson, 1986). Student success is paramount in the educational system; therefore, understanding this construct and the variables strongly associated with it holds great promise for education. Finally, the framework for teacher efficacy provided by Bandura (1977) established that high self-efficacy contributes to pursuing challenging goals, increased goal commitment, and the expectation that the goal will be achieved in spite of setbacks. By developing a better understanding of the teacher efficacy construct and strongly related variables, variables that make a positive difference in teacher efficacy can be deliberately addressed, thereby constituting a research base that has the potential to make a positive difference in the teacher profession.

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